



芯高科技
HIGH TECH
TECHNOLOGY LIMITED

HT6310 (45W + 18W) ACDC充電器 雙通道PD, QC

應用注解
Application Note

雙輸出充電器
測試單元: 20102801

2021/3/29 | 機密文件

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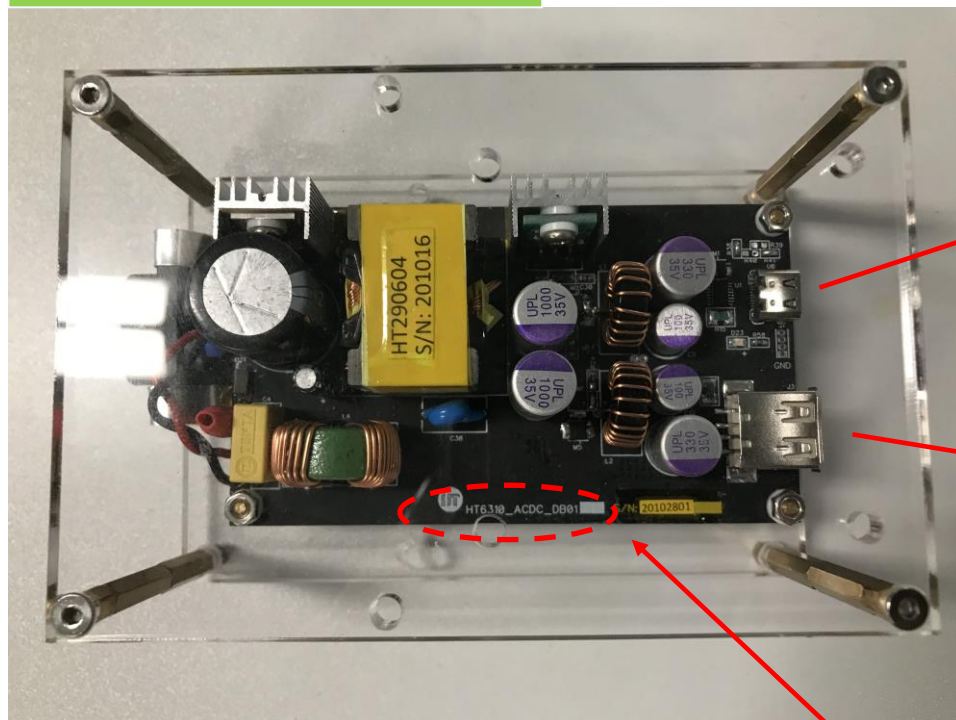
1. 演示板介紹

HT6310 (45W + 18W) ACDC充電器
雙通道PD, QC



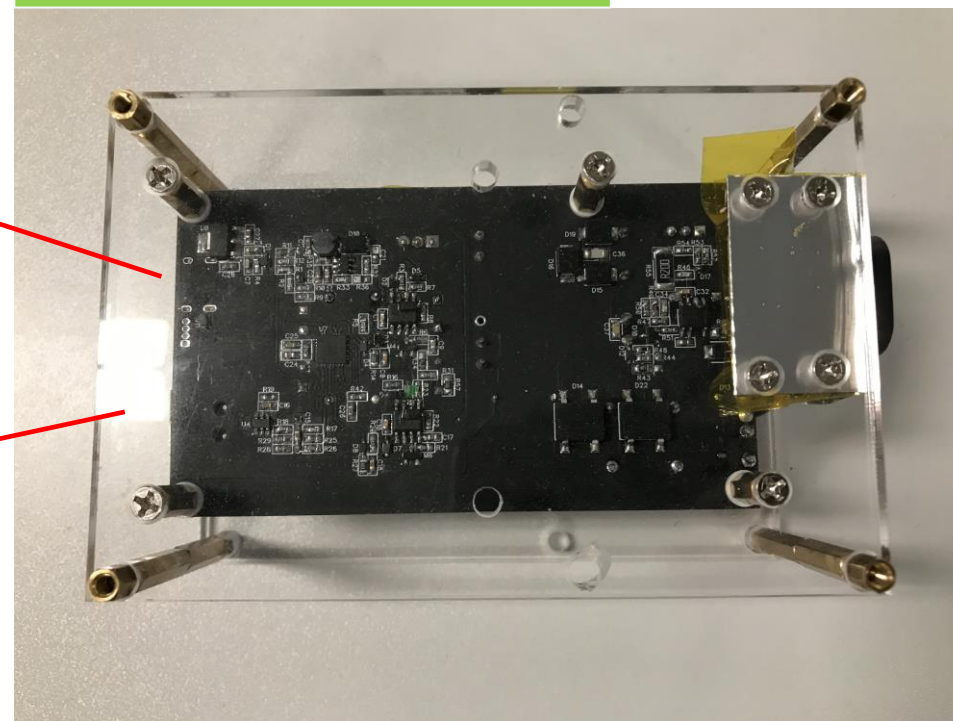
- 演示板 (測試單元: 20102801)
- 尺寸: 120mm(長) x 57mm(闊) x 30mm(高)

演示板 (頂視圖)



HT6310_ACDC_DB01

演示板 (底視圖)



輸出 1

輸出 2

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2. 摘要

HT6310 (45W + 18W) ACDC充電器 雙通道PD, QC



操作模式:	Ch1	Ch2
輸入電壓範圍	100VAC to 220VAC	
輸出電壓和電流範圍 (最大輸出功率是 45W + 18W)	(5V 3A), (9V 3A), (15V 3A), (20V 2.25A)	(5V 3A), (9V 2A), (12V 1.5A)
主要支持的快速充電協議	PD 2.0	QC 3.0 **
尺寸	120mm(長) X 57mm(闊) X 30mm(高)	
最大輸出功率	45W	18W
負載調節(Load Regulation)準確度	輸出電壓在不同負載下準確度達 94%#	
最大功率轉換效率	91%	85%
短路(Short Circuit)測試	✓	

** QC3.0: Based on QUALCOMM webpage: Charge up to 4 times faster than conventional 5W chargers.
(<https://www.qualcomm.com/news/onq/2015/09/14/introducing-quick-charge-30-next-generation-fast-charging-technology>)

Definition: (Actual Vout / Target Vout) %

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3. 測試規格



輸入電壓

100 V, 220 V

輸出電壓和電流

• CH1

- 5 V, 0 – 3 A (15 W)
- 9 V, 0 – 3 A (27 W)
- 15 V, 0 – 3 A (45 W)
- 20 V, 0 – 2.25 A (45 W)

• CH2

- 5 V, 0 – 3 A (15 W)
- 9 V, 0 – 2 A (18 W)
- 12V, 0 – 1.5 A (18 W)

雙路輸出的總輸出電流及功率

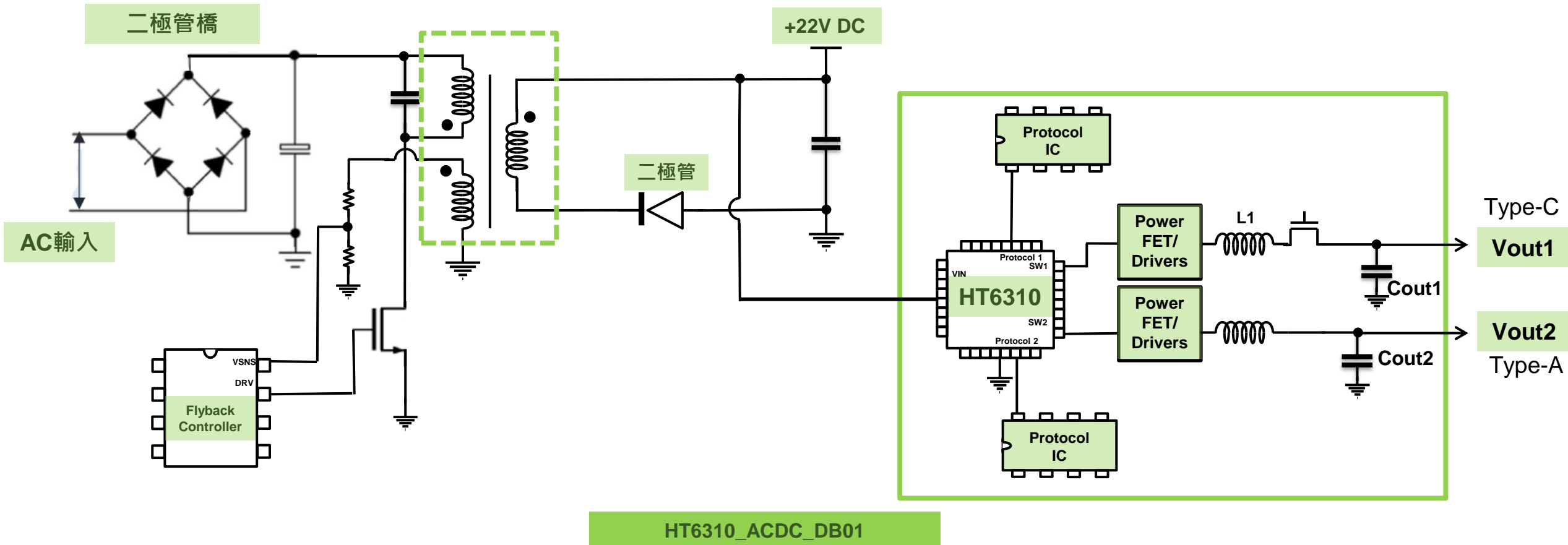
- 最大總輸出電流為 6 A
- 總功率最高為63 W (45W + 18W)

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4. 演示板介紹



設計簡約*



* 有關完整的電路圖，請參見附錄I。

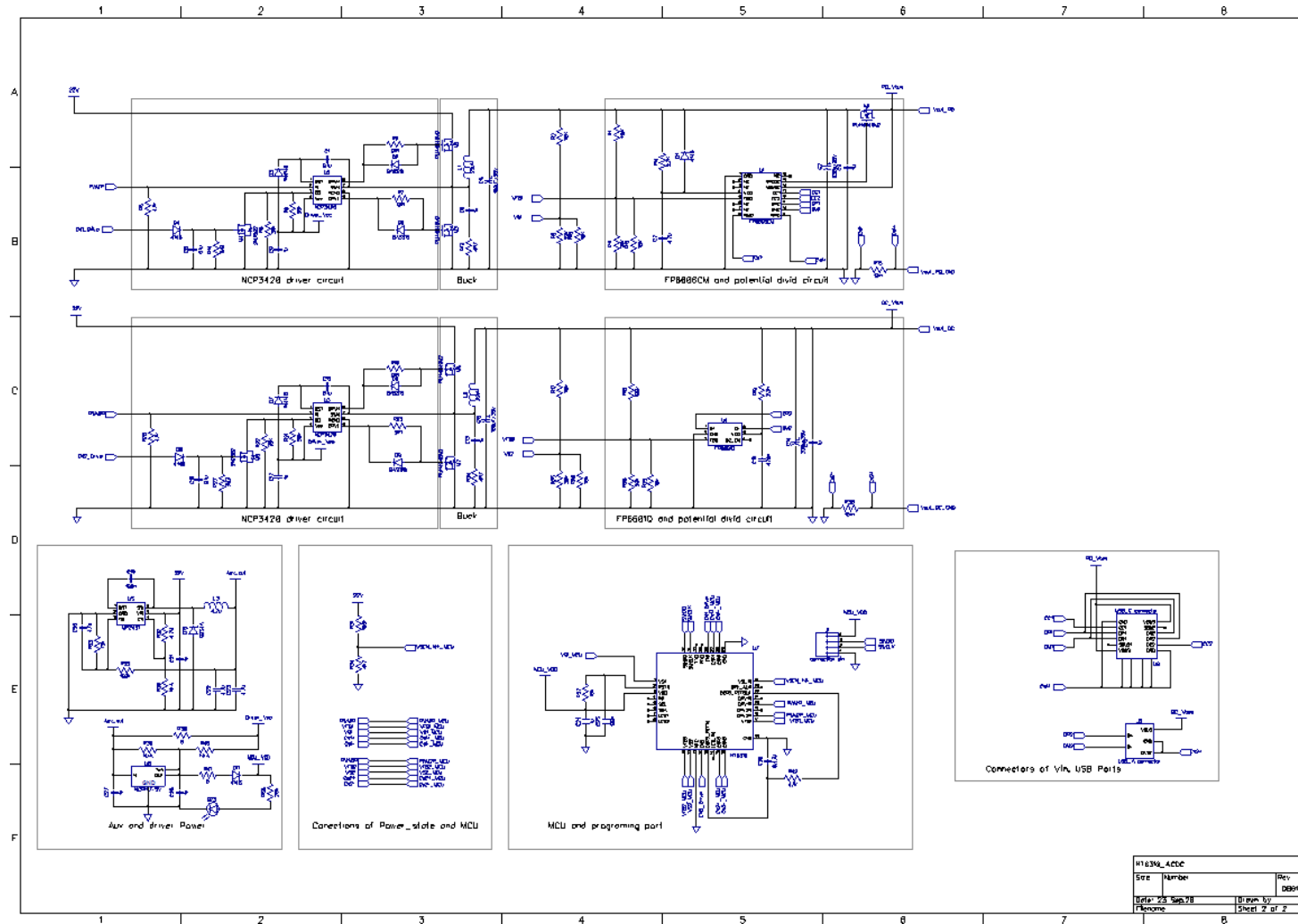
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5. 附錄 I

HT6310 (45W + 18W) ACDC充電器 雙通道PD, QC



- 演示板原理圖
(物料清單詳見附錄II)



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6. 附錄 II

HT6310 (45W + 18W) ACDC充電器 雙通道PD, QC



- 演示板物料

RefDes	Name	Type	Value	Package	Part Number	Quantity
			Capcitor			
C20	CAP_0603	Cap	47p	0603		1
C6, C13	CAP_0603	Cap	1n	0603		2
C1, C8, C10, C18	CAP_0603	Cap	0.1u	0603		4
C19	CAP_0603	Cap	100n	0603		1
C16	CAP_0603	Cap	470n	0603		1
C26	CAP_0603	Cap	0.47u	0603		1
C3	CAP_0603	Cap	1U	0603		1
C9, C15, C17, C21, C27, C28	CAP_0603	Cap	1u	0603		6
C7	CAP_0603	Cap	4.7U	0603		1
C22, C23	CAP_0603	Cap	4.7u	0603		2
C34	CAP_0603		10p/50V	0603		1
C32	CAP_0603		120p/100V	0603		1
C31	CAP_0603		1u/50V	0603		1
C37	CAP_0805		1000p/100V	0805		1
C36	CAP_1206		10p/500V	1206		1
C38	Y1 10X4		2200p/400V	CAPD-10x2/9x4		1
C29	5X6.8		22u/25V	CAPPR-2/5h11	UPW1E220MDD	1
C35, C39	5/10x13		680uF/35V	CAPPR-5/10h10.5	EEU-HD1V681	2
C25	CAP_0603	Cap	100n			1
C4	X2 10mm		0.33u			1
C24	CAP_0603	Cap	1u			1
C30	CAP_0603		0 ohm			1
C5, C12	100uF 50V	Ecap	100uF/35V			2
C2, C14	330uF 35V 5/10x13	Ecap	330u/35V			2
C33	82uF 400V 7.5/18X25	Ecap	82uF 400V			1

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Diode						
D1, D4, D8, D11	BAS316	Diode	4148			4
D2, D5, D6, D9	BAS316	Diode	BAS316			4
D3, D7	1N4148	Diode	1N4148			2
D10	SMA	Diode	SS34A			1
D12	1N4148		1N4148	SOD-323	1N4148	1
D13, D21	1N4007		1N4007	SMB	1N4007	2
D14, D22	DF06F2		GBU4			2
D15	Zenor-SMB		82V	SMB	1SMB5947	1
D16	Zenor-SMB		100V	SMB	1SMB5949	1
D17	BAS316		BAS316	SOD-323	BAS316	1
D18	BAV70		BAV70	SOT23	BAV70	1
D19			MURS160	SMB	MURS160	1
D20	MBR20200CT		MBR20200CT	TO-220	MBR20200CT	1
D23	LED0805					1
Connector						
J1	GRP041VWVN		connection pin			1
J3	USB_F	Connector	USB_A connector			1
Inductor						
L1, L2	L_20mm_H_V2	Inductor	22uH			2
L3	CD32	Inductor	4.7u			1
L4	CMF 10mm	Filter				1
FET						
M1, M2, M3, M5, M7	NMOS_PDFN3333	N-MOS	RUH4040M2			5
M4, M6	2N7002	N-MOS	2N7002			2
M8	N-MOSFET		IPP60R180P7	TO-220	IPP60R360P7	1

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Resistor					
R38, R41, R58	RES_0603	Res		00603	3
R53	RES_0603		4R7	0603	1
R3, R7, R16, R23	RES_0603	Res	9R1	0603	4
R47	RES_0603		100R	0603	1
R52	RES_0603			2000603	1
R46	RES_0603		1k	0603	1
R19	RES_0603	Res	2.2k	0603	1
R4	RES_0603	Res	2.7K	0603	1
R51	RES_0603		3.9k	0603	1
R34	RES_0603	Res	4k7	0603	1
R37	RES_0603	Res	10k	0603	1
R33	RES_0603	Res	13k	0603	1
R10, R12	RES_0603	Res	18K	0603	2
R26, R29	RES_0603	Res	18k	0603	2
R48	RES_0603		33k	0603	1
R8, R22, R25, R28	RES_0603	Res	39k	0603	4
R9, R11	RES_0603	Res	39K	0603	2
R50	RES_0603		39k	0603	1
R5, R20, R42	RES_0603	Res	47k	0603	3
R6, R21	RES_0603	Res	56k	0603	2
R49	RES_0603		91k	0603	1
R18, R31, R35	RES_0603	Res	100k	0603	3
R54	RES_0603		100k	0603	1
R1, R2	RES_0603	Res	110K	0603	2
R17	RES_0603	Res	110k	0603	1
R44	RES_0603		130k	0603	1
R14, R27	RES_0603	Res	3M3	0603	2
R32	RES_0603	Res	4.7M	0603	1
R36, R39, R40	RES_0603	Res	N/A	0603	3
R13, R24	RES_0805	Res	4R7	0805	2
R43	RES_0805		4.7R	0805	1
R57	RES_0805	Res	100k	0805	1
R45	RES_1206		100k	1206	1
R15, R30	RES_1210	Res	10m	1210	2
R55	RES_2512		200m	2512	1
R56	RES_1206		110v zenor		1

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6. 附錄 II

HT6310 (45W + 18W) ACDC充電器 雙通道PD, QC



IC						
U1	FP6606CM		FP6606CM			1
U2, U3	NCP3420	Half bridge driver	NCP3420	SOIC8	NC3420	2
U4	FP6601Q	PD protocol	FP6601Q		FP6601Q	1
U5	MP2451		MP2451			1
U6	TypeC-16p		USB_C connector			1
U7	Copy_of_HT5010_32p(DB01)		HT6310			1
U8	NCP1117	LDO	NCP1117-5V	SOT223		1
U9	UCC28630		UCC28630	SOIC-7/150mil	UCC28630	1
Other						
F1	FUSE 3mm_v		3A	3mm_V		1
Tx2	PQ26/25_10p		HT290604			1

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